

THE CATALPA SPHINX is a common hawk or sphinx moth, figure 1³, but it is the caterpillar stage, figure 2, that is most often encountered and best known. The caterpillars, commonly called catalpa worms or "catawba" worms, feed on leaves of catalpa and often completely strip trees of foliage. Loss of foliage may be serious, especially for shade and ornamental trees and nursery stock. While the catalpa worm is well known as a tree pest, it

¹*Ceratomia catalpae*. Order Lepidoptera; Family Sphingidae.

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³All photographs are shown on pages 4 and 5.

may be as well or better known to some for its attractiveness to fish. The caterpillars have long been valued for fish bait, and references to their collection by fishermen date back at least to the 1870's when the species was first described (1).

Distribution and Hosts

The catalpa sphinx occurs throughout much of eastern United States from Florida to New York west to Michigan, Iowa, Kansas, and Texas (2). It is generally most common in the southern states. Catalpa is its only host plant, and all species of catalpa are apparently sub-



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ject to attack. Two native species, southern catalpa (*Catalpa bignoniodes*) and northern catalpa (*C. speciosa*), are common. Southern catalpa is the species common to Alabama. The tree is native to the southern states and occurs naturally along rivers and margins of swamps(3). It is a medium-sized tree with broad crown, large leaves, and showy white, purple-tinted flowers. Northern catalpa is very similar to southern catalpa. It occurs naturally as an occasional tree in some central and south-central states--Indiana, Illinois and south to Arkansas and Tennessee(3). Both catalpas have been widely planted and have become established outside their natural habitats.

Description of Life Stages

There are four life stages: egg, larva, pupa, and adult. The adult, figure 1, is a large, stout-bodied moth. The body is gray, spindle-shaped, and 30-35 mm⁴ long. Wings are mostly mottled gray-brown, and span 65-70 mm when extended. Adults are strong fliers, but fly mostly at dusk or night and are not commonly seen.

Eggs, figure 3, are small, oval, about 0.66 mm long, 0.5 mm in diameter(1), and whitish, greenish, to cream-yellow in color. They are deposited in mound-like masses on the undersurface of leaves.

Larvae, or caterpillars, figures 2, 4, 5, 6, and 7, are white to pale yellow when first hatched, figure 4,

and each has a conspicuous black spine or horn on the back at the rear, figure 5. As larvae grow, coloration changes; the head is black, the body whitish to pale yellow with black markings, figure 5. Full-grown caterpillars, figures 2, 6, 7, are 70-75 mm long. Coloration is somewhat variable, and there appear to be two primary color phases, dark and pale. In the dark phase, figures 2 and 6 (bottom), there is a broad, solid black band down the back bordered by white lines. The sides are yellowish with some black spots and vertical lines. In the pale phase, the solid black band is lacking. Instead, there may be black spots along the midline of the back, figure 6 (top), and/or narrow, broken black lines along the edges of the back, figure 7. Sides of the larva are generally greenish yellow.

The pupa, figure 8, is bare (no cocoon), reddish brown, and 30-35 mm long.

Life Cycle, Habits, and Importance

The catalpa sphinx overwinters as a pupa in the soil under or near trees infested the previous season. In spring, pupae work their way to the soil surface and moths begin to emerge shortly after host trees have leafed out. Time of moth emergence varies considerably by locality within the range and even from year to year in the same locality, depending on temperature and general weather conditions. In Lee County in east-central Alabama, spring moth activity can be expected

⁴One inch equals about 25 mm

in most years from about mid April into early May. Moths mate and females lay eggs in masses on the under-surface of leaves. Masses may contain 100-1000 eggs(1); the mass in figure 3 contained 666 eggs and covered an area about the diameter of a nickel. Eggs usually hatch in five to seven days(1); in normal years in Lee County and vicinity, hatch has usually occurred and first-brood larvae are present by mid-May. Newly hatched caterpillars feed as a group skeletonizing areas of leaf, figure 9. Later, larvae separate and feed singly, consuming whole leaves except for stubs of midribs and large veins. Duration of the caterpillar stage varies but generally is about three weeks. Full-grown caterpillars enter the soil and pupate. New adults of summer generations emerge in about two weeks, but pupae of the last brood of the season overwinter in the soil and moths do not emerge until the following spring. The total length of the life cycle is about six weeks. In Alabama, three or four generations may occur in a single season, and caterpillars may be present into fall. Time of moth emergence and duration of developmental stages vary, consequently, generations often overlap and different life stages and caterpillars of different sizes may be present at the same time.

Infestations of the catalpa sphinx occur sporadically; they come and go and often seem to be highly localized. Certain trees appear to be

preferred and are attacked regularly while others of the same catalpa species seem to escape attack; the reason for this is not fully known. Caterpillars may be abundant for one, two, or three years, then scarce for several. Natural enemies, i.e., parasites and predators, take a heavy toll of eggs and larvae, and are largely responsible for maintaining populations at low levels. One of the most common and important parasites is a small wasp that attacks the larva. The female wasp deposits eggs through the skin of the caterpillar. Wasp larvae feed and develop inside, then emerge to the outside and spin conspicuous white, silken cocoons on the caterpillar skin, figure 10. Parasitized catalpa worms do not survive to adulthood.

When caterpillars are numerous, infested trees may be completely defoliated. Defoliated catalpas produce new leaves readily and trees usually re-foliate promptly. However, with multiple generations occurring, new foliage may be consumed by subsequent broods. Most trees survive but some dieback may occur. Severe defoliation over several consecutive years can cause death of trees. Multiple defoliations of nursery stock, figure 11, may adversely affect survival of young trees when transplanted.

The catalpa tree, with its broad, dense crown and showy flowers, is prized by many as a shade or ornamental tree. Catalpa worms can essentially destroy this ornamental value. In this circumstance, the cat-

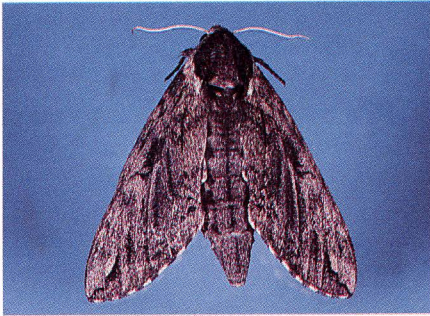


Figure 1. Catalpa sphinx adult.



Figure 2. Full-grown larvae feeding.

Figure 3. Egg mass of the catalpa sphinx.



Figure 4. Egg mass and newly hatched larvae.



Figure 5. Mid-stage caterpillars showing spot markings and prominent horns.



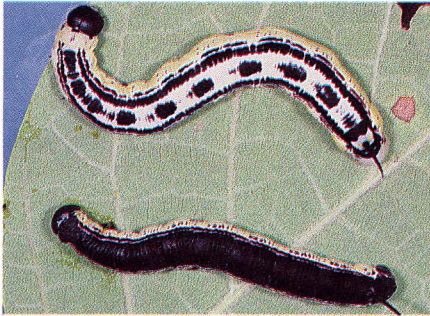


Figure 6. Full-grown catalpa worms showing spot markings and prominent horns.

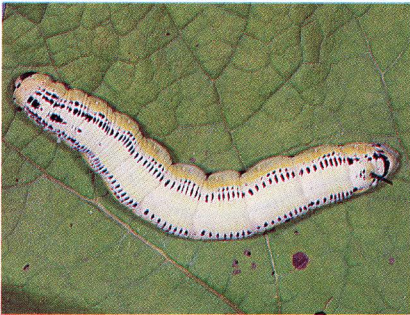


Figure 7. Full-grown catalpa worm of pale color phase.



Figure 9. Mass of hatched eggs and leaf with skeletonized areas typical of feeding by newly hatched larvae.

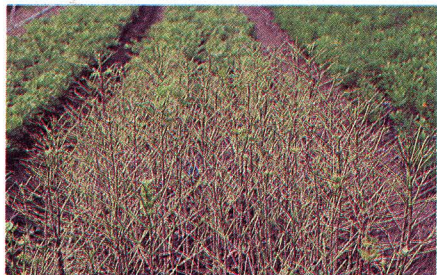


Figure 8. Catalpa sphinx pupa.



Figure 10. (Aboveright) Catalpa worm with cocoons of wasp parasite.

Figure 11. Catalpa seedlings in the nursery defoliated by catalpa worm.



alpa sphinx is a destructive, unwanted pest. However, there is another viewpoint. As indicated previously, catalpa worms are prized for fish bait. To many fishermen their presence is welcomed, even encouraged. Catalpa foliage is the only food of the catalpa worm, and it is likely that many catalpa trees are planted and maintained as much or more for production of fish bait as for any other purpose. Whether the catalpa sphinx is destructive or beneficial is a matter of point of view.

REFERENCES

- (1) Baerg, W. J. 1935. Three shade tree insects, II. University of Arkansas Agric. Expt. Stn. Bull. No. 317, 28 pp.
- (2) Drooz, A. T. [ed.]. 1985. Insects of Eastern Forests. U.S. For. Serv. Misc. Publ. 1426, 608 pp.
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